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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of: **IDEI, et al.**

Group Art Unit: 1774

Serial No.: 09/508,617

Examiner: **L. Ferguson**

Filed: **March 14, 2000**

P.T.O. Confirmation No.: 8477

For: **PAPER FOR INK JET AND ELECTROPHOTOGRAPHIC RECORDING**

SUBMISSION OF SECOND APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

August 26, 2004

Sir:

Submitted herewith are an original and two copies of a Second Appeal Brief in the above-identified U.S. patent application.

A check in the amount of \$330.00 was submitted with the first Appeal Brief filed on January 21, 2004, and it is requested that that fee be applied to this Second Appeal Brief. In the event that any additional fees are due with respect to this paper, please charge Deposit Account No. 01-2340. This paper is filed in triplicate.

Respectfully submitted,
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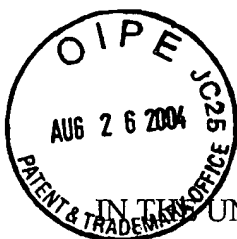
NSB/alw
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PATENT TRADEMARK OFFICE

Enclosures: Duplicate of this paper; Second Appeal Brief and two copies



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

SECOND APPEAL BRIEF FOR THE APPELLANTS

Ex parte IDEI, et al. (applicant)

Serial Number: 09/508,617

Filed: March 14, 2000

Appeal No. : Not Yet Assigned

Group Art Unit: 1774

Examiner: L. Ferguson

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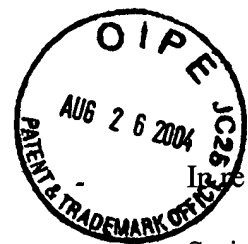


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PATENT TRADEMARK OFFICE

Date: August 26, 2004

Atty. Docket No. 000225



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: **IDEI et al.**

Examiner: **L. Ferguson**

Serial No.: **09/508,617**

Group Art Unit: **1774**

Filed: **March 14, 2000**

Confirmation No.: **8477**

For: **PAPER FOR INK JET AND
ELECTROPHOTOGRAPHIC RECORDING**

Attorney Docket: **000225**

SECOND APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

August 26, 2004

Sir:

In response to the Final Office Action dated July 13, 2004, which re-opened prosecution, the Appellant submit this Second Brief on Appeal.

REAL PARTY IN INTEREST

The real party in interest is Mitsubishi Paper Mills Limited, 4-2, Marunouchi-3-chome, Chiyoda-ku, Tokyo, Japan.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claim 2 was canceled and claim 5 was added by the Amendment of September 4, 2003. Claims 1 and 3-5 are rejected. The claims on appeal are 1 and 3-5.

STATUS OF AMENDMENTS

All amendments are believed to have been entered.

SUMMARY OF THE INVENTION

Claim 1 recites:

A paper for ink jet and electrophotographic recording which comprises a support having [1] a cationic resin adhered thereto in a dry adhering amount of 0.5-2.0 g/m² and [2] which has a surface resistivity of $1.0 \times 10^9 - 9.9 \times 10^{13} \Omega$, wherein [3] the cationic resin has a cation equivalent of 3-8 meq/g [4] as measured by colloidal titration method.

The support is the body of the paper, exemplified by pulp in dependent claim 4.

When paper is used for electrophotographic recording (e.g., in a photocopier) the electrical surface resistivity, feature [2] above, is important. The surface resistivity is a measure of how slowly static charges will migrate across the paper surface due to an electric field created by an uneven distribution of electric charges on the paper. The surface resistivity is analogous to the simple resistance in Ohm's law, which governs how fast electric charges move (i.e., the magnitude of the electric current) as a function of resistance and voltage. In the case of static charges on a surface, a voltage difference between two points is caused by the presence of charge in one area and the lack of charge in an adjoining area: the electric field of the charged area will drive charge across the paper, redistributing the charge to become uniform, which corresponds to uniform gray on a photocopy.

In electrophotographic processes, imaging is based on electrostatic charge patterns. In a photocopier, for example, toner powder is drawn to the pattern of electric charge on the paper, and the toner is then fixed (usually by heat) before the electric charge dissipates. The surface resistivity of a paper is a measure of how slowly a pattern of electric charge will dissipate. To allow time for fixing the image, a high surface resistivity is preferable.

Some treatments that increase the surface resistivity also cause poor absorption of liquid ink, which has caused problems when photocopier paper was used in ink-jet printers (Appellants'

specification, page 3, lines 18-26). In the prior art, cationic resins have been added to make paper better suited to ink-jet use, but these cationic resins have decreased the surface resistivity, which makes the paper less useful for photocopiers (page 3, lines 5-18; see also page 4, line 26 to page 6, line 3). Making a paper suitable for both uses was difficult.

However, the Appellants found through their research (page 4, line 2) that the subject matter of claim 1 (features [1] and [3] above) overcomes the problems of the prior art. This subject matter includes a specific range of surface resistivity in combination with a specific range of cationic resin, where the cationic resin has a particular cation equivalent, measured in meq/g.

The Appellants' specification describes (page 3, lines 5-18) how they use a cationic resin to achieve both good water resistance and properties related to electrophotographic recording, with a dry adhering amount of 0.5-2.0 g/m² and a cation equivalent of the cationic resin being 3-8 meq/g (page 6, lines 4-12).

The colloidal titration method for measuring cationic resin (feature [4] above) is explained at page 7, lines 12-22.

Claim 5 recites that the surface resistivity is $1.0 \times 10^{10} - 9.9 \times 10^{11} \Omega$, instead of $1.0 \times 10^9 - 9.9 \times 10^{13} \Omega$ as in claim 1. As discussed below, the range of claim 5 does not overlap any range of the prior art. Claim 5 is the first claim argued for.

Claim 3 recites that the support has a neutral rosin sizing agent or an alkenyl succinic anhydride as an internal sizing agent.

GROUPING OF CLAIMS

Claim 1, claim 3, and claim 5 should be considered independently (should not stand or fall together). This is argued for below.

ISSUES

Whether claims 1, 4, and 5 are unpatentable under 35 U.S.C. §103(a) over Fujioka (U.S. Patent 4,279,961).

Whether claim 3 is unpatentable under 35 U.S.C. §103(a) over Fujioka in view of Shepherd (U.S. Patent 4,207,142).

(In the statement of the rejection in the first paragraph of ¶ 3 on page 2 of the Office Action, the Examiner states that Claims 1 and 4-5 are rejected over Fujioka in view of Tanaka (U.S. Patent 5,252,184). However, the Examiner then states (line 3 of ¶ 5 on page 4) that “Tanaka is withdrawn” and later, on page 5 states, “Arguments toward the Tanaka reference are moot due to the reference being withdrawn.” Also, Tanaka is not mentioned anywhere in the main rejection of ¶ 3, except the first paragraph as noted above. It appears that the Examiner drafted the new rejection using the old rejection as a template, but forgot to remove Tanaka from the first paragraph. The Apellants, accordingly, respond as if only Fujioka is applied.)

ARGUMENT: GROUPING OF CLAIMS

Claim 1 and claim 5 should be considered independently because claim 1 recites a range of surface resistivity which *overlaps* with the range disclosed by the applied prior art, while claim 5 recites a range which *abuts* the range disclosed by the applied prior art. As is argued further below, this difference is relevant to the question of range anticipation, and therefore to patentability.

Separate consideration of claim 3 is also requested (this is a change from the first Appeal Brief) on the grounds that claim 3 is now separately rejected over a reference not applied to the other claims.

ARGUMENT: REJECTION OF CLAIM 5

Fujioka. The Examiner relies on Fujioka for disclosing a range of surface resistivity in an electrostatic recording medium. Fujioka's range is stated to be, "most suitably," 10^6 to 10^{10} ohms (col. 1, lines 33 and 41, and col. 5, line 42).

Fujioka discloses that the range of 10^6 to 10^{10} ohms is associated with an amount of coating composition measuring "2 to 20 g/m², preferably about 5 to about 15 g/m² by dry weight" (col. 5, line 43). However, Fujioka's coating composition is *not* the cationic resin which is claimed by the Appellants.

Cationic resin is mentioned at col. 5, line 12 in Fujioka, but this cationic resin is only one possible component of the coating composition (Fujioka says the resin is "usable" in the composition at col. 5, line 12). The most important ingredients of Fujioka's coating composition are zinc oxide powder and coloring agent (the honorable Board is invited to note Fujioka's claim 1). Cationic resin is not even mentioned in any of the examples, and no percentage or amount of cationic resin is disclosed *anywhere* in the patent. The only disclosure concerning cationic resin is that it is usable and that various specific cationic resins are suggested (col. 5, lines 17-35).

Fujioka does not disclose a cation equivalent measured by colloidal titration method, nor does Fujioka disclose a cation equivalent value measured in units of meq/g.

Fujioka does not disclose any cation equivalent that is measured by colloidal titration method, as the Appellants claim.

Appellants' Arguments. Below, the Appellants present their arguments for claim 5 and point out errors in the rejection.

(1) CATIONIC RESIN AMOUNT. In the response to arguments (§ 5 on page 4), the Examiner as asserts (pages 4-5), "Applicant does not claim an amount of cationic resin." However, this is plainly incorrect because claim 1 recites "cationic resin ... in a dry adhering *amount* of 0.5-2.0 g/m² ... wherein the cationic resin has a cation equivalent of 3-8 meq/g as measured by colloidal titration method."

As discussed above, Fujioka only mentions cationic resin as a possible ingredient and gives no amount, much less any range of cationic resin; the reference is completely lacking disclosure relating to the *amount* of cationic resin, and mentions no units in which such an amount might be disclosed (e.g., meq/g). Furthermore, Fujioka fails to disclose any measurement of cation equivalent by colloidal titration method.

The Examiner Admits Lack of Disclosure But Asserts Inherent Obviousness. The Examiner admits (pages 2-3), “Fujioka is silent toward a cation equivalent.” But the Examiner then states (page 3, line 3; see also page 5, line 13):

“Fujioka's recording material would be expected to be the same as claimed, absent any evidence to the contrary.”

The Examiner's assertion that the Appellants' subject matter is “expected,” presumably by the person of ordinary skill in the art, is respectfully questioned. There is no legal basis for this statement—the person of ordinary skill “expects” nothing, deduces nothing, and knows nothing except what is suggested by the prior art. The Examiner brings forth absolutely no evidence for his assertion, contrary to MPEP § 2143 and the case law cited there (including *Graham v. John Deere*).

Furthermore, the Examiner's statement appears to shift the burden of proof to the Appellants by requiring that they demonstrate *non-obviousness* with “evidence to the contrary.” This is respectfully submitted to be contrary to §MPEP 2142, which states, “The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness.” The elements of a *prima facie* case are outlined in MPEP §2143, and include (1) showing suggestion or motivation to modify the reference (not provided); (2) showing that all claim limitations are in the prior art (not done); and (3) reasonable expectation of success (not discussed). Only *after* the Examiner makes a sufficient case, does the burden shift to the Appellants.

Weight of Measurement Method. The Examiner maintains (page 3, line 1) that “as measured by colloidal titration” is a method limitation that deserves no patentable weight. The Appellants respectfully point out that what is claimed is the cation equivalent, and “as measured by colloidal titration” modifies that feature. As the honorable Board knows, a measured numerical quantity depends on what it is measured with: for example, when a length is measured by an inch rule and again by a centimeter rule, the two measurements will differ by a factor of 2.54.

Here, in comparing the claims and the prior art, the units are the same (both meq/g). But even when the units are the same, a measurement can still depend on the measuring instrument used (because instruments are not perfect). Therefore “as measured by colloidal titration” should have been given weight by the Examiner.

Furthermore, even if the measurement method is ignored as the Examiner proposes, that would not *remove* the limitation of a cation equivalent of 3-8 meq/g from the claim; it could only *modify* that feature, at most.

(2) SURFACE RESISTIVITY RANGE. Dependent claim 5 recites a narrower range of surface resistivity than base claim 1. The range of claim 5 and the range disclosed by the reference do not overlap, but instead abut (meet at a single point). The point where the surface resistivity ranges abut is 10^{10} ohms.

There is a legal question as to whether the Appellants' claimed ranges are anticipated: Does a disclosed range from A to B anticipate a claimed range from B to C? MPEP §2131.03 (Anticipation of Ranges) states, “When the prior art discloses a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation.”

Fujioka's Examples. Fujioka has no specific examples falling within the claimed ranges. Indeed, that would not be possible unless its examples were outside of the range it discloses (since the claimed range and Fujioka's range abut, as mentioned above).

Furthermore, Fujioka's examples of surface resistivity are far from the abutment point; all are between 2.9×10^7 ohms (col. 7, line 10) and 5×10^8 ohms (col. 9, line 42). The highest exemplary value is twenty times less than the lowest point of the Appellants' claimed range.

The Appellants already argued on the basis of the lack of examples in the Amendment of September 4, 2004, at lines 11-14 on page 11. In the final rejection of October 31, 2003, the Examiner did not traverse the Appellants' argument on any basis of fact.

While the Examiner did not traverse on facts, the Examiner did argue that Fujioka is “not limited to the examples,” and quoted Fujioka's boilerplate statement at col. 6, lines 9-11 to the effect that it is not limited by the examples. The honorable Board is invited to consider that Fujioka's boilerplate was probably directed only to avoiding limitation to its *claims*, and does not constitute any teaching that its disclosed *examples* are in any way unsatisfactory. As noted, all the examples are within the disclosed range, and Fujioka states that surface resistivity range is “most suitably” within the disclosed range.

Furthermore, Fujioka states that values outside the preferred range are *unworkable*: “a reduced image density will result at ... 10^{11} ohms [this is the middle of the Appellants' range of claim 5], and little or no record will be reproduced at 10^{12} ohms [near the upper end of the Appellants' claimed range]. Accordingly [Fujioka's paper has] a resistivity of 10^6 to 10^{10} ohms” (col. 1, lines 33-41).

Thus, Fujioka does *not* teach to move away from the examples into the Appellants' claimed range. Even if Fujioka were not limited to its examples (for the record, this is traversed), it is still limited to its disclosed range because all of the examples are inside the range and there is no teaching to go outside of the disclosed range. The Examiner's assertion that Fujioka is not limited to its examples is respectfully submitted to be irrelevant, even if correct (not admitted).

Sufficient Specificity. MPEP §2131.03 further states that a legal test for anticipation is that the disclosure have “sufficient specificity” to anticipate a feature. However, the Examiner has not cited any *specific* example of teaching in the applied art in response to the Appellants'

arguments. The rejection of October 31 in ¶ 4 (Response to Arguments), on pages 2-4 of the Office Action, cites only general teachings on this point.

Three Types of Range Interaction. In making a determination under MPEP §2131.03, the honorable Board is solicited to consider that of the three relations of range mentioned by MPEP §2131.03 (touch, overlap, or occur within), the case of touching or abutting, as with claim 5, is the weakest of the three. Mathematically, ranges which abut share only one point, out of an infinity of points in either range: for practical purposes, they are disjoint. As discussed above, between claim 1 and the applied art there is only abutment of the claimed and prior-art ranges, and no overlap.

Titanium Metals Corp. of America v. Banner. On page 6 the Examiner cites *Titanium Metals Corp. of America v. Banner* for teaching that “a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties.”

The Examiner's reliance on *Titanium Metals* is respectfully questioned on several bases:

(1) This case deals almost entirely with a rejection under §102 and the bulk of the case is entirely unrelated to claim ranges, or to rejections under §103.¹ Only in the final twenty lines of the case does the CAFC discuss the rejection of the single dependent claim 3 under §103. (Claim 3 recited 0.3% Mo and 0.8% Ni, while the prior art disclosed 0.25% Mo—0.75% Ni and 0.31% Mo—0.94% Ni.) The CAFC writes, “the proportions are so close that prima facie one skilled in the art would have expected them to have the same properties,” and concludes that claim 3 is obvious; the conclusion is made without any further analysis relating numerical closeness to obviousness *per se*, without any citation to previous case law, without mentioning the required

¹ In *Titanium Metals* a lower court had mis-applied §102 by confusing novelty itself (an alloy composition) with a benefit of the subject matter recited in the claim (corrosion resistance), and overturned the Board of Appeals because the benefit was not mentioned by the prior art. The CAFC does not address the question of abutting claim ranges in discussing the §102 rejection. The CAFC writes (227 USPQ 778, bottom of first column), “The [prior art] shows a titanium base alloy containing 0.25% by weight Mo and 0.75% Ni and this is *squarely within* the [claimed] ranges ... there can be no doubt that claims 1 and 2 read on it” (emphasis added). The quoted language shows that the case involved anticipation by an example within the claimed range, not overlapping or abutting ranges.

elements of a prima facie case of obviousness, and without any further discussion at all, except to state that the Appellee produced no evidence against obviousness.

The last should be taken in context. The CAFC notes (col. 2 on page 774) that the Board had erroneously ignored the §103 rejection, and that on appeal the §103 rejection was being argued by neither the PTO nor the Appellee. However, the CAFC felt obliged to treat the §103 rejection (there is four times as much text on its decision to consider the §103 rejection as on the merits); and its action is based on an imaginary action by the Board (col. 1 on page 777).

(2) Both claim 3 and the prior art applied against claim 3 disclose examples, not ranges. Claim 3 recites single numbers, and the prior art data were taken from points on a graph (the amounts above were estimated from the graph points by an expert).

If ranges *are* inferred from claim 3, by the one-digit precision of “0.3” and “0.8” then the inferred ranges are 0.25-0.34 and 0.75-0.84, respectively (the CAFC discusses rounding in Note 4, col. 1 on page 777). These inferred ranges in claim 3 are *anticipated* by the prior art 0.25% Mo—0.75% Ni, and there is no question of overlapping or abutting ranges.

(3) The technology of *Titanium Metals* is different from that of the Appellants' claims and therefore the CAFC's premise, that similar properties should be expected, is not on point for this case.

In sum, *Titanium Metals* is not strong case law for a §103 rejection dealing with ranges.

(3) DENSITY RANGE. Fujioka discloses that its zinc-oxide-and-dye coating composition is applied in a density range from 2 to 20 g/m², while the Appellants' cationic resin density range is 0.5-2.0 g/m². Even if Fujioka did disclose cationic resin, there would still be no range overlap. Furthermore, Fujioka's examples² are far from the abutment point, 2.0 g/m².

²Fujioka's examples of density are 10 g/m² (col. 6, line 42 and col. 8, line 24); 5 g/m² (col. 8, line 21); and 15 g/m² with ten on one side, five on the other side (col. 8, lines 12-14). These values are all at least two and a half times as great as the Appellants' claimed range. Similarly, Fujioka teaches that coating composition is added “... *preferably* about 5 to about 15 g/m² by dry weight” (col. 5, line 44 of Fujioka; emphasis added).

(4) “**INTENDED USE.**” the Examiner asserts (page 3, line 13) that “for ink jet and electrophotographic recording ” in the preamble of claim 1 carries no weight. The Examiner's assertion is challenged, because the weight of preamble features is decided on a case-by-case basis and a mere assertion has little probative value. As best understood, the Examiner makes this statement to weaken the Appellants' arguments that relate to the uses of their paper, which in turn relate to the claim features recited in the body of claim 1. However, even if *ad arguendo* the preamble is given no weight (not admitted) , the Appellants' paper *can* be used for ink jet and electrophotographic recording, and so the advantages remain; and therefore the relevance of the Appellants' arguments also remains.

ARGUMENT: REJECTION OF CLAIM 1

Claim 1 differs from claim 5 in that the claimed surface resistivity range overlaps the range disclosed by Fujioka, rather than abutting it as is the case with claim 5; the range of claim 1 extends down to 1.0×10^9 ohms. As was noted above, the highest value of surface resistivity in Fujioka's examples is 5×10^8 ohms (at col. 9, line 42), and that is only half of the Appellants' lowest claimed value (i.e., 1.0×10^9 ohms). As with claim 5, there is no teaching to go beyond that example with the disclosed range. As was also noted above, Fujioka states that values in the range of claim 1 are unworkable: “a reduced image density will result at ... 10^{11} ohms, and little or no record will be reproduced at 10^{12} ohms.”

ARGUMENT: REJECTION OF CLAIM 3

Claim 3 recites alkenyl succinic anhydride. As the Examiner points out, the secondary reference Shepherd discloses this at col. 2, line 40: “GB Pat. ... (equivalent to U.S. Pat. No. 3,102,064) discloses [substances] which include substituted succinic anhydrides ... as sizing agents.” Shepherd shows a schematic chemical formula and states that one part of the formula (R') can include alkenyl. However, this disclosure describes Shepherd's prior art, not Shepherd's invention.

At column 6, lines 9-17, Shepherd states that “long-chain succinic anhydride derivatives,” analogous to claim 3, is marketed under the trade name “Fibran.” Shepherd then (col. 6, lines 18-34) discusses the disadvantages of Fibran and states (line 35), “An object of the present invention is ... sizing agents which have the desirable properties of existing products without the attendant disadvantages.” In other words, Shepherd proposes other compounds in place of that claimed by the Appellants. Shepherd teaches *against* the subject matter of claim 3.

A sizing agent is used to reduce absorption of liquid water (see the attached photocopy from the *Encyclopaedia Britannica*), but Fujioka is concerned with electrostatic properties of paper and is little concerned with the effect of liquid water—wet paper is conductive, whether it got wet slowly or quickly. Fujioka is not seen to teach any need for specific sizing agents, and the Examiner points out no teaching in Fujioka toward combination.

Neither reference teaches toward combination.

For the reasons above, the honorable Board is requested to reverse the rejections.

Respectfully submitted,

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APPENDIX I—CLEAN VERSION OF CLAIMS ON APPEAL

1. (original): A paper for ink jet and electrophotographic recording which comprises a support having a cationic resin adhered thereto in a dry adhering amount of 0.5-2.0 g/m² and which has a surface resistivity of $1.0 \times 10^9 - 9.9 \times 10^{13} \Omega$, wherein the cationic resin has a cation equivalent of 3-8 meq/g as measured by colloidal titration method.

2. (canceled)

3. (original): A paper for ink jet and electrophotographic recording according to claim 1, wherein the support has a neutral rosin sizing agent or an alkenyl succinic anhydride as an internal sizing agent.

4. (original): A paper for ink jet and electrophotographic recording according to claim 1, wherein the support contains a waste paper pulp.

5. (previously presented): A paper for ink jet and electrophotographic recording according to claim 1, wherein the surface resistivity is $1.0 \times 10^{10} - 9.9 \times 10^{11} \Omega$.

APPENDIX II—TABLE OF AUTHORITIES

Encyclopedia Britannica, 15th Edition (photocopy from Volume 13 attached)

Titanium Metals Corp. of America v. Banner (attached)

MPEP (Manual of Patent Examining Procedure)



The New Encyclopædia Britannica

in 30 Volumes

MACROPÆDIA
Volume 13

Knowledge in Depth

FOUNDED 1768
15 TH EDITION



Encyclopædia Britannica, Inc.
William Benton, Publisher, 1943–1973
Helen Hemingway Benton, Publisher, 1973–1974

Chicago
Auckland/Geneva/London/Manila/Paris/Rome
Seoul/Sydney/Tokyo/Toronto

peroxide bleached groundwood, 66 to 72; single-stage hypochlorite sulfite, 80 to 85; multistage bleached pulp, 85 to 88; and multistage with chlorine dioxide, 90 to 94.

MANUFACTURE OF PAPER AND PAPERBOARD

Preparation of stock. Mechanical squeezing and pounding of cellulose fibre permits water to penetrate its structure, causing swelling of the fibre and making it flexible. Mechanical action, furthermore, separates and frays the fibrils, submicroscopic units in the fibre structure. Beating reduces the rate of drainage from and through a mat of fibres, producing dense paper of high tensile strength, low porosity, stiffness, and rattle.

The Hollander beater. An important milestone in papermaking development, the Hollander beater consists of an oval tank containing a heavy roll that revolves against a bedplate. The roll is capable of being set very accurately with respect to the bedplate, for the progressive adjustment of the roll position is the key to good beating. A beater may hold from 300 to 3,000 pounds (135 to 1,350 kilograms) of stock, a common size being about 24 feet (7 metres) long, 12 feet (4 metres) wide, and about 3.5 feet (1 metre) deep. A centre partition provides a continuous channel.

Pulp is put into the beater, and water is added to facilitate circulation of the mass between the roll and the bedplate. As the beating proceeds, the revolving roll is gradually lowered until it is riding full weight on the fibres between it and the bedplate. This action splits and mashes the fibres, creating hairlike fibrils and causing them to absorb water and become slimy. The beaten fibres will then drain more slowly on the paper machine wire and bond together more readily as more water is removed and the wet web pressed. Much of the beating action results from the rubbing of fibre on fibre. Long fibres will be cut to some extent.

Sizing,
fillers,
and dyes

The beater is also well-adapted for the addition and mixing of other materials, such as sizing, fillers, and dyes. By mounting a perforated cylinder that can rotate partially immersed in the beater stock, water can be continuously removed from the beater, and the stock can be washed.

Though many design modifications have been made in the Hollander beater over the years, the machine is still widely used in smaller mills making specialty paper products. For large production modern mills have replaced the beater by various types of continuous refiners.

Conical refiner. In mills that receive baled pulp and use refiners, the pulp is defibred in pulpers. While there are a number of variations in basic design, a pulper consists essentially of a large, open vessel, with one or more bladed, rotating elements that circulate a pulp-water mixture and defibre or separate fibres. The blades transform the pulp or wastepaper into a smooth mixture. Unlike beaters and refiners, pulpers do not reduce freeness and cause fibrillation in the fibres. A typical pulper has a capacity of 2,000 pounds (900 kilograms) of fibre in 6 percent solution and requires 150 horsepower to drive it.

The original continuous refiner is the Jordan, named after its 19th-century inventor. Like the beater, the Jordan has blades or bars, mounted on a rotating element, that work in conjunction with stationary blades to treat the fibres. The axially oriented blades are mounted on a conically shaped rotor that is surrounded by a stationary bladed element (stator).

Disk refiner. Like other refiners, the disk refiner consists of a rotating bladed element that moves in conjunction with a stationary bladed element. The disk refiner's plane of action, however, is perpendicular to the axis of rotation, simplifying manufacture of the treating elements and replacement. Since the disk refiner provides a large number of working edges to act upon the fibre, the load per fibre is reduced and fibre brushing, rather than fibre cutting, may be emphasized.

Sizing. Sizing has been described above as the treatment given paper to prevent aqueous solutions, such as ink, from soaking into it. A typical sizing solution consists of a rosin soap dispersion mixed with the stock in an

amount of 1 to 5 percent of fibre. Since there is no affinity between rosin soap and fibre, it is necessary to use a coupling agent, normally alum (aluminum sulfate). The acidity of alum precipitates the rosin dispersion, and the positively charged aluminum ions and aluminum hydroxide flocs (masses of finely suspended particles) attach the size firmly to the negatively charged fibre surface.

Filling or loading. Paper intended for writing or printing usually contains white pigments or fillers to increase brightness, opacity, and surface smoothness, and to improve ink receptivity. Clay (aluminum silicate), often referred to as kaolin or china clay, is commonly used, but only in a few places in the world (Cornwall, in England, and Georgia, in the United States) are the deposits readily accessible and sufficiently pure to be used for pigment. Another pigment is titanium dioxide (TiO_2), prepared from the minerals rutile and anatase. Titanium dioxide is the most expensive of the common pigments and is often used in admixture with others.

Calcium carbonate, also used as a filler, is prepared by precipitation by the reaction of milk of lime with either carbon dioxide (CO_2) or soda ash (calcium carbonate, Na_2CO_3). Calcium carbonate as a paper filler is used mainly to impart improved brightness, opacity, and ink receptivity to printing and magazine stocks. Specialty uses include the filling of cigarette paper, to which it contributes good burning properties. Because of its reactivity with acid, calcium carbonate cannot be used in systems containing alum.

Other fillers are zinc oxide, zinc sulfide, hydrated silica, calcium sulfate, hydrated alumina, talc, barium sulfate, and asbestos. Much of the filler consumed is used in paper coatings (see below).

Since most fillers have no affinity for fibres, it is necessary to add an agent such as alum to help hold the filler in the formed sheet. The amount of filler used may vary from 1 to 10 percent of the fibre.

Colouring. The most common way to impart colour to paper is to add soluble dyes or coloured pigment to the paper stock. Many so-called direct dyes with a natural affinity for cellulose fibre are highly absorbed, even from dilute water solution. The so-called basic dyes have a high affinity for groundwood and unbleached pulps.

Interfibre bonding agents. Various agents are added to paper stock to enhance or to modify the bonding and coherence between fibres. To increase the dry strength of paper, the materials most commonly used are starch, polyacrylamide resins, and natural gums such as locust bean gum and guar gum. The most common type of starch currently used is the modified type known as cationic starch. When dispersed in water, this starch assumes a positive surface charge. Because fibre normally assumes a negative surface charge, there is an affinity between the cationic starch and the fibre.

The natural cellulose interfibre bonding that develops as a sheet of paper dries is considered to be due to interatomic forces of attraction known to physical chemists as hydrogen bonding or van der Waals forces (see CHEMICAL BONDING). Because these attractive forces are neutralized or dissolved in water, wet paper has practically no strength. Though this property is convenient for the recovery of wastepaper, some papers require wet strength for their intended use. Wet strength is gained by adding certain organic resins to the paper stock that, because of their chemical nature, are absorbed by the fibre. After formation and drying of the sheet, the resins change to an insoluble form, creating water-resistant bonds between fibres.

Formation of paper sheet by machines. In a paper machine, interrelated mechanisms operating in unison receive paper stock from the beater, form it into a sheet of the desired weight by filtration, press and consolidate the sheet with removal of excess water, dry the remaining water by evaporation, and wind the travelling sheet into reels of paper. Paper machines may vary in width from about five to over 25 feet (1.5–eight metres), in operating speed from a few hundred feet to over 3,000 feet (900 metres) per minute, and in production of paper from a few tons per day to over 300 tons (270,000 kilograms)

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The Supreme Court has recognized the various problems which are created when a District Court adopts proposed findings of fact and conclusions of law without change. Nevertheless, as the majority notes, the Supreme Court has indicated that such findings are not to be rejected out of hand and are still subject to a clearly erroneous standard of review. *Anderson v. Bessemer City*, — U.S. —, 105 S.Ct. 1504, 1511, 84 L.Ed. 2d 518, 527 (1985); *United States v. Marine Bancorporation*, 418 U.S. 602, 615 n. 13 (1974); and *United States v. El Paso Natural Gas Co.*, 376 U.S. 651, 656-57 (1964). Notably, however, *Anderson* is factually distinguishable from the case at bar. The Court in *Anderson* specifically found that the trial judge had issued a preliminary opinion, that the judge had not “uncritically accepted the [proposed] findings” and that the opposing party had been given an opportunity to respond to the proposed findings. 84 L.Ed. 2d at 527. Similarly, the Court in *Rosemount, Inc. v. Beckman Instruments, Inc.*, 727 F.2d 1540, 1544 n. 4, 221 USPQ 1, 5-6 (Fed. Cir. 1984), found that the District Court issued a memorandum decision. Finally, it is worth noting that although the Supreme Court has “sug- gest[ed] that even when the trial judge adopts proposed findings verbatim, the findings are those of the court and may be reversed only if clearly erroneous,” it has at the same time strongly criticized the practice. *Anderson*, 84 L.Ed. 2d at 527. See also, *Marine Bancorpora- tion*, and *El Paso Natural Gas Co.*, *supra*.

I concur in the majority opinion because I find that although the Supreme Court has criticized the practice of adopting proposed findings verbatim, it has held that the clearly erroneous standard is not thereby rendered inapplicable. I agree with the majority that the findings of fact in this case withstand scrutiny under such a standard of review. Nevertheless, I feel that several very close factual questions were presented in this case and wonder whether the District Court would have reached the same result had it separately prepared the findings.

Although I feel constrained to agree that this Court must decide this case as it has, I believe that an alternative exists which would more effectively protect the procedures set forth in Rule 52(a). That alternative would be to simply remand cases such as the one now before this Court to the District Court for its reconsideration. Such a rule would have two beneficial effects. First, it would ensure proper consideration of a case by a District Court. Second, it would leave intact the clearly erroneous standard of review; a standard which

appears to have been undermined *sub silencio* in some cases on appeal in an effort by the Courts of Appeal to compensate for inadequate consideration by a District Court.

By this suggestion, I do not denigrate the value and importance of having the parties assist the Court in its task by submitting proposed findings of fact and conclusions of law. Moreover, I do not envision this procedure to be one that will be used frequently. When, however, the record contains no indication of the District Court's own reasoning for its holding, and when the proposed findings have been adopted verbatim by a District Court without any opportunity for the opposing party to file objections, the better course of action would be to remand the case to the District Court for its reconsideration. Nevertheless, while I believe that such a practice would be in keeping with the spirit, if not the letter, of Rule 52, it has not yet been approved by the Supreme Court and I therefore concur in the majority opinion.

Court of Appeals, Federal Circuit

Titanium Metals Corporation of America v.
Banner

No. 85-1452

Decided November 7, 1985

PATENTS

1. Patentability — Anticipation — In general (§51.201)

Federal district court erred by authorizing issuance of patent on claims that, properly construed, are anticipated under 35 USC 102 by published article which admittedly disclosed alloy on which these claims read.

2. Patentability — Invention — Specific cases — Chemical (§51.5093)

Specific claimed alloy, whose compositions are in such close proportions to those in prior art that, *prima facie*, one skilled in art would have expected them to have same properties, must be considered to have been obvious from known alloys.

Particular patents — Alloys

Covington and Palmer, Titanium Alloy, order for issuance of patent reversed.

Appeal from District Court for the District of Columbia, Penn. J.; 225 USPQ 673.

Action by Titanium Metals Corporation of America, against Donald W. Banner Commissioner of Patents and Trademarks, under 35 USC 145. From judgment for plaintiff, defendant appeals. Reversed.

Fred E. McKelvey, Deputy Solicitor (Joseph F. Nakamura, Solicitor, and Henry W. Tarring, II, Associate Solicitor, on the brief) for appellant.

David C. Breuning, and Webb, Burden, Robinson & Webb, P.A., both of Pittsburgh, Pa. (Richard L. Byrne, Pittsburgh, Pa. on the brief) for appellee.

Before Rich and Newman, Circuit Judges, and Nichols, Senior Circuit Judge.

Rich, Circuit Judge.

This appeal is from an Order of the United States District Court for the District of Columbia in a civil action brought pursuant to 35 U.S.C. § 145 against Donald W. Banner as Commissioner of Patents and Trademarks¹ authorizing the Commissioner to issue to appellee a patent containing claims 1, 2, and 3 of patent application serial No. 598,935 for "TITANIUM ALLOY." The Commissioner has appealed. We reverse.

Background

The inventors, Loren C. Covington and Howard R. Palmer, employees of appellee to whom they have assigned their invention and the application thereon, filed an application on March 29, 1974, serial No. 455,964, to patent an alloy they developed. The application involved on this appeal is a continuation-in-part thereof, filed July 25, 1975, containing the three claims on appeal. The alloy is made primarily of titanium (Ti) and contains small amounts of nickel (Ni) and molybdenum (Mo) as alloying ingredients to give the alloy certain desirable properties, particularly corrosion resistance in hot brine solutions, while retaining workability so that articles such as tubing can be fabricated from it by rolling, welding and other techniques. The inventors apparently also found that iron content should be limited,

iron being an undesired impurity rather than an alloying ingredient. They determined the permissible ranges of the components, above and below which the desired properties were not obtained. A precise definition of the invention sought to be patented is found in the claims; set forth below, claim 3 representing the preferred composition, it being understood, however, that no iron at all would be even more preferred.

1. A titanium base alloy consisting essentially by weight of about 0.6% to 0.9% nickel, 0.2% to 0.4% molybdenum, up to 0.2% maximum iron, balance titanium, said alloy being characterized by good corrosion resistance in hot brine environments.

2. A titanium base alloy as set forth in Claim 1 having up to 0.1% iron, balance titanium.

3. A titanium base alloy as set forth in Claim 1 having 0.8% nickel, 0.3% molybdenum, up to 0.1% maximum iron, balance titanium.

The examiner's final rejection, repeated in his Answer on appeal to the Patent and Trademark Office (PTO) Board of Appeals (board), was on the grounds that claims 1 and 2 are anticipated (fully met) by, and claim 3 would have been obvious from, an article by Kalabukhova and Mikheyev, *Investigation of the Mechanical Properties of Ti-Mo-Ni Alloys*, Russian Metallurgy (Metally) No. 3, pages 130-133 (1970) (in the court below and hereinafter called "the Russian article") under 35 U.S.C. § § 102 and 103, respectively. The board affirmed the examiner's rejection. However, it mistakenly proceeded on the assumption that all three claims had been rejected as anticipated under § 102 by the Russian article, and ignored the obviousness rejection. On this appeal the PTO says it does not pursue the § 103 rejection further. Appellee proceeds on the basis that only the § 102 rejection is before us.

Both the examiner and the board had before them as evidence three affidavits by Rosenberg, Palmer, and Hall and a declaration by Minkler, by which they were not persuaded of patentability.

The Russian article is short (3 pages), highly technical, and contains 10 graphs as part of the discussion. As its title indicates, it relates to ternary Ti-Mo-Ni alloys, the subject of the application at bar. The examiner and the board both found that it would disclose to one skilled in the art an alloy on which at least claims 1 and 2 read, so that those claims would not be allowable under the statute because of lack of novelty of their subject matter. Since the article does not specifically disclose such an alloy in words, a little thinking is required about what it would disclose to one knowl-

¹ After suit was brought and before entry of said Order, Commissioner Gerald J. Mossinghoff, Banner's successor in office, was substituted as defendant. He has, in turn, been succeeded by Donald J. Quigg, but no formal substitution of Quigg has been made.

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(3 pages), high- raphs as part of ates, it relates to : subject of the miner and the l disclose to one which at least se claims would itute because of t matter. Since disclose such an ing is required to one knowl-

edgeable about Ti-Ni-Mo alloys. The PTO did that thinking as follows:

Figure 1c [a graph] shows data for the ternary titanium alloy which contains Mo and Ni in the ratio of 1:3. Amongst the actual points on the graph is one at 1% Mo + Ni. At this point, the amounts of Mo and Ni would be 0.25% and 0.75% respectively. A similar point appears on the graph shown in Figure 2 of the article.

Appellants do not deny that the data points are disclosed in the reference. In fact, the Hall affidavit indicates at least two specific points (at 1% and 1.25% Mo + Ni) which would represent a description of alloys falling within the scope of the instant claims.

On that basis, the board found that the claimed alloys were not new, because they were disclosed in the prior art. It having been argued that the Russian article contains no disclosure of corrosion-resistant *properties* of any of the alloys, the board held:

The fact that a particular property or the end use for this alloy as contemplated by appellants was not recognized in the article is of no consequence.

It therefore held the Russian article to be an anticipation, noting that although the article does not discuss corrosion resistance, it does disclose other properties such as strength and ductility. The PTO further points out that the authors of the reference must have made the alloys to obtain the data points.

Being dissatisfied with the decision of the board, Titanium Metals Corporation of America, as assignee of the Convington and Palmer application, then brought an action in the District Court for the District of Columbia against the Commissioner pursuant to 35 U.S.C. § 145, its complaint alleging that the board's decision "was erroneous and contrary to law," and making proffer of a certified copy of the application and all papers in the file thereof, together with a copy of the Russian article which was the sole basis of the PTO refusal to allow the claims. It prayed that the court adjudge it entitled to a part containing claims 1-3 and authorize the Commissioner to grant such a patent. The Commissioner filed an answer denying that the applicants were the first inventors of the alloys claimed or entitled to a patent, alleging that the claims are not patentable under the law, and making proffer of the Examiner's Answer, the Board of Appeals' decision, and the prior art reference.

The case came on for trial on January 24, 1980, before the Honorable John G. Penn and was concluded in two and a half hours. The testimony of one witness was heard by the

court, Dr. James C. Williams, professor at Carnegie-Mellon University in Pittsburgh and an expert in titanium metallurgy. His testimony was about equally divided between direct and cross examination.

At the conclusion of the plaintiff's case, the following exchange took place between the judge and the Associate Solicitor for the PTO:

THE COURT: All right. Mr. Tarring?

MR. TARRING: Your Honor, generally the position of the Patent Office is we rely on the position of the tribunals below, the examiner and the Board of Appeals and their decisions are both present in the exhibit which I submitted earlier. I was not quite sure whether you would prefer that we have a post-trial brief in the matter. If that's your preference we could do that or I could make an argument on the basis of the law right now. I don't know what your preference would be. Otherwise, I'm not going to call any witnesses.

THE COURT: You are not going to what?

MR. TARRING: I have no intention of calling any witnesses so it's really a matter of argument at this point, I think.

THE COURT: Of course, I have received your pre-trial briefs.

After further discussion, it was settled that both parties would file further briefs after the hearing transcript had been prepared. They were filed in April and May, 1984. On November 16 the District Court entered the Order appealed from followed on November 28 by a supporting memorandum opinion. January 10, 1985, the PTO filed its Notice of Appeal. This court has heard oral argument and received briefs.

The District Court Opinion

The trial court's memorandum opinion² having been published, we shall merely outline its contents.

After stating the nature of the action and the relief sought, Part I is a summarization of the contents of the patent specification, a statement of the issues, and of the PTO rejection which is stated both correctly as the examiner made it and incorrectly as the board assumed it to be. Part II is a statement of the District of Columbia Circuit Court of Appeals' attitude toward plaintiff's burden on review of the PTO board decisions in § 145 actions, namely, that it is a "heavy burden," "great weight" being given to

² Reported sub nom. *Titanium Metals Corporation of America v. Mossinghoff*, 603 F.Supp. 87, 225 USPQ 673 (D. D.C. 1984).

the PTO decision because of its "expertise," a "thorough conviction" that it erred being required, as well as a lack of a "rational basis for its conclusions." In Part III is a brief discussion of "anticipation" under § 102 with citation of two cases from our predecessor Court of Customs and Patent Appeals, *In re Wilder*, 429 F.2d 447, 166 USPQ 545 (1970), and *In re LeGrice*, 301 F.2d 929, 133 USPQ 365 (1962), with emphasis placed on their holdings that an anticipatory reference must be an "enabling" reference, the implication being that the Russian article perhaps does not enable one to know all the things that the plaintiff's inventors disclosed in their application, such as the range limits of the alloying ingredients Mo and Ni and the corrosion resistance. The court then states that after considering all of the affidavit and declaration evidence which was before the PTO, it still lacked the necessary "thorough conviction" required to overturn the PTO decision even though, left to its own judgment of the evidence, it would be willing to do so. It then reviewed the evidence of Dr. Williams taken before it. Dr. Williams was qualified as an expert in titanium metallurgy but not in patent law. The questions he was asked, however, pertained to the interpretation of patent claims, as quoted in the court's opinion. The court was of the view that his testimony "fully supports the arguments made by the plaintiff in this case" and found it "to be very persuasive." The court then concluded that claims 1-3 were not anticipated and that claim 3 was wrongly rejected as directed to obvious subject matter. In the court's view, Dr. Williams' testimony tipped the scales in favor of issuing a patent.

OPINION

1. Jurisdiction

This suit was brought in the district court pursuant to 35 U.S.C. § 145. Our jurisdiction rests on 28 U.S.C. § 1295(a)(4)(C) which provides as follows:

§ 1295. *Jurisdiction of the United States Court of Appeals for the Federal Circuit*

(a) The United States Court of Appeals for the Federal Circuit shall have exclusive jurisdiction —

(4) of an appeal from a decision of —

(C) a district court to which a case was directed pursuant to section 145 or 146 of title 35;

This case having been directed to the District Court for the District of Columbia by § 145,

this court's jurisdiction is *exclusive* of the Court of Appeals for the District of Columbia and is therefore governed by the precedents of this court and its predecessor courts. See *South Corporation v. United States*, 690 F.2d 1368, 215 USPQ 657 (Fed. Cir. 1982).

Strange as it may seem to any district judge not to be governed by the precedents of his own Court of Appeals, that is the situation created by Congress in the Federal Courts Improvement Act of 1982, § 402 of Pub. L. 97-164, Apr. 2, 1982, 96 Stat. 37, effective Oct. 1, 1982, in the interest of promoting a uniform patent law by having only one Court of Appeals deciding questions of patent law, whether review be of decisions of the Patent and Trademark Office or of district court judgments in cases arising under the patent laws of the United States. Cf. § 1295(a)(1). We do not fault the district judge, however, for having stated the precedents of his own circuit in this § 145 case because this is one of the first occasions we have had to review a judgment in such a case. Nor do we need to determine whether we should apply those precedents here.

2. The rejections under review

Tracing the PTO rejections under review below, we encounter confusion. Although we are reviewing the judgment (in the form of an order) of the district court,¹ the effect of that order is to hold that the PTO's rejections of claims 1-3 were in error. The actual holding of the district court was:

The Court concludes that Claims 1, 2 and 3 should not have been rejected on the basis of anticipation pursuant to 35 U.S.C. § 102. Moreover, the Court concludes that Claim 3 should not have been rejected as being obvious pursuant to 35 U.S.C. § 103.

Thus, the Court finds as a fact and concludes as a matter of law that the decision of the Board of Appeals was in error. The testimony of Dr. Williams, which remains uncontradicted, adds sufficient weight to the

¹ The Order entered Nov. 16, 1984, after preliminary recitations, reads as follows:

ORDERED that the Commissioner of Patents and Trademarks is authorized to issue to plaintiff, Titanium Metals Corporation of America, as assignee and owner of application Serial No. 598,935, United States Letters Patent on Titanium Alloy including Claims Nos. 1, 2 and 3 in due form as prescribed by the Patent Laws of the United States.

The ultimate issue actually before us is *whether the patent laws permit the Commissioner to issue such a patent.*

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exclusive of the district of Columbia by the precedents of our courts. See *South*, 690 F.2d 1368, 1982).

any district judge precedents of his own in the situation created by the Courts Improvement Act of Pub. L. 97-164, effective Oct. 1, 1980, promoting a uniform one Court of Appeals patent law, whether of the Patent and Trademark Office or the district court judge of the patent laws of 35(a)(1). We do not, however, for having our own circuit in this case, one of the first to review a judgment in need to determine those precedents

Under review

ions under review. Although we (in the form of an opinion) the effect of that the PTO's rejections of the actual holding

Claims 1, 2 and 3 were rejected on the basis of 35 U.S.C. § 102. It includes that Claim 3 was rejected as being obvious under § 103.

as a fact and conclude that the decision of the court was in error. The court, which remains a sufficient weight to the

June 6, 1984, after preliminary

allows: Commissioner of Patents and Trademarks to issue to plaintiff, American Association of Patent Attorneys, Serial No. 1,2 and 3 in due Patent Laws of the

are us is whether the Commissioner to issue such a

plaintiff's side to tip the scales and, in the Court's view, to result in clear and convincing evidence that the application should not have been rejected.

Thus, the court deemed all three claims to have been rejected for anticipation under § 102. The examiner never so rejected claim 3. The board opinion, as above noted, erroneously assumed that he had, never gave any special or separate attention to claim 3, never discussed obviousness or § 103, and concluded its opinion with the words "The decision of the examiner is affirmed." The board made no new rejection, as it might have done, under 37 CFR 196(b). Under these circumstances, we shall assume that the board intended to, and did, affirm only the rejection that the examiner had made, as we have stated at the beginning, and that the only rejection outstanding against claim 3 is for obviousness under § 103.

The district court assumed there were two outstanding rejections against claim 3. We have reduced it to one.

The appellee, because it quite evidently suits its argument best, has preferred to ignore the § 103 rejection of claim 3, but we do not because it exists in the official record.

The PTO brief says the Commissioner "is not pursuing" the § 103 rejection in this court, but it is before us whether or not pursued by the PTO. The PTO Solicitor developed a new theory in his brief, never propounded by either the examiner or the board, to support a § 102 rejection of claim 3 on the Russian article,⁴ but that was clearly beyond his province and we disregard it as amounting to a new ground of rejection. We also disregard it as contrary to many holdings of this court and its predecessors that anticipation under § 102 can be found only when the reference discloses exactly what is claimed and that where there are differences

⁴ Resting on the fact that the Russian Article discloses an alloy containing 0.75% Ni and 0.25% Mo, the Solicitor's argument is as follows:

Moreover, this alloy falls within the scope of claim 3, which specifies 0.8% nickel, 0.3% molybdenum, up to 0.1% iron and balance titanium. Inasmuch as this claim specifies the content of nickel and molybdenum to a tenth of a percent, the claim, given the broadest reasonable interpretation, would cover alloys the amounts of whose contents would correspond to the claim language when expressed in tenths of a percent. Following the usual convention of rounding off hundredths to tenths by increasing the tenths digit by one when the hundredths digit to be dropped is five or greater, the alloy of the Russian article, expressed in tenths of a percent, would contain 0.8% nickel, 0.3% molybdenum and balance titanium, corresponding to the alloy specified in tenths of a percent in claim 3.

between the reference disclosure and the claim, the rejection must be based on § 103 which takes differences into account. D. Chisum, *Patents* § 3.02.

We have undertaken to settle the question whether we are dealing with one ground of rejection or two for the further reason that the standard of review of this court may vary in accordance with what the rejection is and whether it is considered to be a finding of fact or a conclusion of law. We have held that anticipation is a finding of fact, reviewable under the "clearly erroneous" standard, *Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 758 F.2d 613, 225 USPQ 634 (Fed. Cir. 1985), and that obviousness is a conclusion of law not subject to that restraint, but is freely reviewable. *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 1344, 220 USPQ 777, 782 (Fed. Cir. 1984). That may make a difference in our review.

3. The merits

Finding, as we do, that claim 3 was never purposefully rejected under § 102, both the board and the district court being confused about that fact, we are left with the propriety of the rejection of claims 1 and 2 under § 102 and the rejection of claim 3 under § 103, both rejections having been held by the district court to have been erroneous. That necessarily follows from the court's conclusion "that the Claims are patentable." We find that conclusion contrary to statutory law and will deal with the two grounds of rejection separately.

A. Anticipation, § 102

From consideration of the trial court's memorandum opinion, we are unable to determine whether it erred because of misconstruction of the claims, misreading of what the reference discloses, lack of proper advice on the requirements of the patent statute respecting patentability, or the technical legal meaning of "anticipation," a term which some courts have erroneously used from time to time.

We are left in no doubt that the court was impressed by the totality of the evidence that the applicants for patent had discovered or invented and disclosed knowledge which is not to be found in the reference, nor do we have any doubt about that ourselves. But those facts are beside the point. The patent law imposes certain fundamental conditions for patentability, paramount among them being the condition that what is sought to be patented, as determined by the claims, be new. The basic provision of Title 35 applicable here is § 101, providing in relevant part: "Whoever invents

or discovers any new . . . composition of matter, or any new . . . improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." (Emphasis ours.) The title of the application here involved is "Titanium Alloy," a composition of matter. Surprisingly, in all of the evidence, nobody discussed the key issue of whether the alloy was new, which is the essence of the anticipation issue, including the expert Dr. Williams. Plaintiff's counsel, bringing Dr. Williams' testimony to its climax, after he had explained the nature of the ingredients, the alloys made therefrom, and their superior corrosion resistance in hot brine, etc., repetitively asked him such questions as "Does the [Russian] article *direct you* as one skilled in the art to a titanium alloy having nickel present in an amount between .6 and .9 percent molybdenum in an amount between .2 and .4 percent?" (emphasis ours) followed by "Is there anything mentioned in the article about corrosion resistance?" Of course, the answers were emphatically negative. But this and like testimony does not deal with the critical question: do claims 1 and 2, to which the questions obviously relate, *read on or encompass* an alloy which was already known by reason of the disclosure of the Russian article?

Section 102, the usual basis for rejection for lack of novelty or anticipation, lays down certain principles for determining the novelty required by § 101, among which are the provisions in § 102(a) and (b) that the claimed invention has *not* been "described in a printed publication in this or a foreign country," either (a) before the invention by the applicant or (b) more than one year before the application date to which he is entitled (strictly a "loss of right" provision similar to novelty). Either provision applies in this case, the Russian article having a date some 5 years prior to the filing date and its status as "prior art" not being questioned. The PTO was never specific as to what part of § 102 applies, merely rejecting on § 102. The question, therefore, is whether claims 1 and 2 encompass and, if allowed, would enable plaintiff-appellee to exclude others from making, using, or selling an alloy *described* in the Russian article. See 35 U.S.C. § 154. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983).

To answer the question we need only turn to the affidavit of James A. Hall, a metallurgist employed by appellee's TIMET Division, who undertook to analyze the Russian article disclosure by calculating the ingredient percentages shown in the graph data points, which he presented in tabular form. There are 15 items in his table. The second item shows a titanium base alloy containing 0.25% by weight Mo and 0.75% Ni and this is squarely

within the ranges of 0.2-0.4% Mo and 0.6-0.9% Ni of claims 1 and 2. As to that disclosed alloy of the prior art, there can be no question that claims 1 and 2 read on it and would be infringed by anyone making, using, or selling it. Therefore, *the statute prohibits* a patent containing them. This seems to be a case either of not adequately considering the novelty requirement of the statute, the true meaning of the correlative term "anticipation," or the meaning of the claims.

By reason of the court's quotations from cases holding that a reference is not an anticipation which does not enable one skilled in the art to practice the claimed invention, it appears that the trial court thought there was some deficiency in the Russian article on that score. Enablement in this case involves only being able to make the alloy, given the ingredients and their proportions without more. The evidence here, however, clearly answers that question in two ways. Appellee's own patent application does not undertake to tell anyone how to make the alloy it describes and seeks to patent. It assumes that those skilled in the art would know how. Secondly, appellee's expert, Dr. Williams, testified on cross examination that given the alloy information in the Russian article, he would know how to prepare the alloys "by at least three techniques." Enablement is not a problem in this case.

As we read the situation, the court was misled by the arguments and evidence to the effect that the inventors here found out and disclosed in their application many things that one cannot learn from reading the Russian article and that this was sufficient in law to justify granting them a patent for their contributions — such things as what good corrosion resistance the claimed alloys have against hot brine, which possibly was not known, and the range limits of the Ni and Mo content, outside of which that resistance diminishes, which are teachings of very useful information. These things the applicants teach the art and the Russian article does not. Indeed, appellee's counsel argued in his opening statement to the trial court that the PTO's refusal of a patent was "directly contrary to the requirement of Article I, Section 8, of the Constitution," which authorizes Congress to create a patent law. But throughout the trial counsel never came to grips with the real issues: (1) what do the claims cover and (2) is what they cover new? Under the laws Congress wrote, they must be considered. Congress has not seen fit to permit the patenting of an old alloy, known to others through a printed publication, by one who has discovered its corrosion resistance or other useful properties, or has found out to what extent one can modify the composition of the alloy without losing such properties.

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